

IN THE CLAIMS:

All of the pending claims 1 through 3, 5, 6, 8 through 20, 22, 23 and 25 through 34 are presented below. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as amended.

Listing of Claims:

1. (Currently Amended) An assembly having ~~comprised of~~ an apparatus ~~and a substrate~~, said apparatus for placing a plurality of conductive spheres on ~~a said~~ substrate, said apparatus of said assembly comprising:
a stencil plate with upper and lower surfaces, and a pattern of a plurality of through-holes said stencil plate configured to place said plurality of conductive spheres in said pattern on a ~~proximate~~ surface of said substrate;
a hopper, said hopper having a bottom opening having a dimension extending across said first pattern for dispensing said spheres into said plurality of through-holes extending across said stencil plate, and being configured such that, as said hopper moves across said portion of said upper surface, only said spheres dropping into said plurality of through-holes escaping from said hopper; and
a positioning apparatus for moving said hopper over said pattern relative said stencil plate to place said spheres into said plurality of through-holes and thereby onto said ~~proximate~~ surface of said substrate; and
a substrate having an upper surface, and bearing conductive sites comprising one of recessed sites and level sites with respect to said upper surface.
2. (Currently Amended) The assembly having an apparatus of claim 1, wherein said spheres drop into and pass downwardly through said through-holes by gravitational force.
3. (Currently Amended) The assembly having an apparatus of claim 1, wherein said pattern corresponds to a pattern of bond pads on said substrate.

4. (Canceled)

5. (Currently Amended) The assembly having an apparatus of claim 1, wherein the diameter of said through-holes of said pattern are greater than the diameter of said spheres by up to 1 mm.

6. (Currently Amended) The assembly having an apparatus of claim 1, wherein said stencil plate is spaced from said substrate to restrain said spheres dropped onto said substrate within said pattern.

7. (Canceled)

8. (Currently Amended) The assembly having an apparatus of claim 1, wherein said stencil plate is spaced from said substrate to restrain said spheres dropped onto depressed bond pads of said substrate.

9. (Withdrawn) An apparatus for placing conductive spheres on a substrate, comprising:
a stencil plate with a first pattern of a plurality of through-holes, said stencil plate configured to place a plurality of conductive spheres in said first pattern on a surface of a substrate;
a shuttle plate parallel to said stencil plate and proximate thereto, said shuttle plate having a second pattern of through-holes corresponding to said first pattern;
apparatus for moving said shuttle plate from a first position wherein said first and second patterns are axially aligned to a second position wherein said first and second patterns are non-aligned; and
conductive sphere supply means for placing said conductive spheres in said first pattern of through-holes.

10. (Withdrawn) The apparatus of claim 9, wherein said supply means is configured to place said conductive spheres in said first pattern of through-holes when said shuttle plate is in said second position.

11. (Withdrawn) The apparatus of claim 9, wherein said supply means is configured to place said conductive spheres in said first pattern of through-holes when said shuttle plate is in said first position.

12. (Withdrawn) The apparatus of claim 9, wherein said first pattern corresponds to a pattern of bond pads on said substrate.

13. (Withdrawn) The apparatus of claim 9, wherein said sphere supply means comprises a bottomless container with side walls extending downward to proximate said movable shuttle plate, wherein said spheres drop into said through-holes of said second pattern as said shuttle is moved, said side walls encompassing a major portion of said first pattern.

14. (Withdrawn) The apparatus of claim 9, wherein said sphere supply means comprises a container having a bottom with a third pattern of through-holes corresponding to said second pattern.

15. (Withdrawn) The apparatus of claim 14, wherein said third pattern is aligned with said first pattern.

16. (Withdrawn) The apparatus of claim 14, wherein said third pattern is non-aligned with said first pattern.

17. (Withdrawn) The apparatus of claim 9, wherein the diameter of said through-holes of said second pattern are greater than the diameter of said spheres by up to 1 mm.

18. (Currently Amended) An assembly having comprised of an apparatus ~~and a substrate~~, said apparatus for positioning a plurality of conductive spheres on a substrate, each conductive sphere of said plurality of conductive spheres having a diameter, said apparatus of said assembly comprising:

- a stencil plate having an upper surface, having a lower surface, having a pattern of a plurality of through-holes each through-hole having a diameter, said stencil plate configured to position said plurality of conductive spheres in said pattern on a proximate surface of said substrate;
- a hopper, said hopper having a bottom opening with a dimension extending across said pattern for dispensing said spheres into said plurality of through-holes of said pattern of said stencil plate, and being configured such that, as said hopper moves across said portion of said upper surface, only said spheres dropping into said plurality of through-holes escaping from said hopper; and
- a positioning apparatus for moving said hopper over said pattern relative of said stencil plate to position said spheres into said plurality of through-holes and thereby onto said proximate surface of said substrate; and
- a substrate having an upper surface, and bearing conductive sites comprising one of recessed sites and level sites with respect to said upper surface.

19. (Currently Amended) The assembly having an apparatus of claim 18, wherein said spheres drop into and pass downwardly through said through-holes by gravitational force.

20. (Currently Amended) The assembly having an apparatus of claim 18, wherein said first pattern corresponds to a pattern of bond pads on said substrate.

21. (Canceled)

22. (Currently Amended) The assembly having an apparatus of claim 18, wherein the diameters of said through-holes of said first pattern are greater than the diameters of said plurality of spheres by up to 1 mm.

23. (Currently Amended) The assembly having an apparatus of claim 19, wherein said stencil plate is spaced from said substrate to restrain said spheres dropped onto said substrate within said first pattern.

24. (Canceled)

25. (Currently Amended) The assembly having an apparatus of claim 20, wherein said stencil plate is spaced from said substrate to restrain said spheres dropped onto depressed bond pads of said substrate.

26. (Withdrawn) An apparatus for positioning conductive spheres on a substrate, each sphere having a diameter, said apparatus comprising:
a stencil plate with a first pattern of a plurality of through-holes, each through-hole having a diameter, said stencil plate configured to position a plurality of conductive spheres in said first pattern on a surface of a substrate;
a shuttle plate parallel to said stencil plate and proximate thereto, said shuttle plate having a second pattern of through-holes corresponding to said first pattern, each through-hole of said second pattern of through-holes having a diameter;
apparatus for moving said shuttle plate from a first position wherein said first and second patterns are substantially aligned to a second position wherein said first and second patterns are non-aligned; and
conductive sphere supply means for positioning said conductive spheres in said first pattern of through-holes.

27. (Withdrawn) The apparatus of claim 26, wherein said sphere supply means is configured to position said conductive spheres in said first pattern of through-holes when said shuttle plate is in said second position.

28. (Withdrawn) The apparatus of claim 26, wherein said supply means is configured to position said conductive spheres in said first pattern of through-holes when said shuttle plate is in said first position.

29. (Withdrawn) The apparatus of claim 26, wherein said first pattern corresponds to a pattern of bond pads on said substrate.

30. (Withdrawn) The apparatus of claim 26, wherein said sphere supply means comprises a bottomless container with side walls extending downwardly to proximate said shuttle plate, wherein said spheres drop into said through-holes of said second pattern as said shuttle plate is moved, said side walls encompassing a major portion of said first pattern.

31. (Withdrawn) The apparatus of claim 26, wherein said sphere supply means comprises a container having a bottom with a third pattern of through-holes corresponding to said second pattern.

32. (Withdrawn) The apparatus of claim 31, wherein said third pattern is aligned with said first pattern.

33. (Withdrawn) The apparatus of claim 31, wherein said third pattern is non-aligned with said first pattern.

34. (Withdrawn) The apparatus of claim 26, wherein the diameters of said through-holes of said second pattern are greater than the diameters of said spheres by up to 1 mm.